

GAO

United States General Accounting Office

Report to the Secretary of Defense

September 1997

# DEFENSE ACQUISITION

## Acquisition Plans for Training Aircraft Should Be Reevaluated



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GAO/NSIAD-97-172

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September 18, 1997

The Honorable William S. Cohen  
The Secretary of Defense

Dear Mr. Secretary:

As you know, the Air Force and the Navy plan to spend \$4 billion on a new aircraft, referred to as the Joint Primary Aircraft Training System (JPATS), to train entry level pilots how to fly. We reviewed (1) the services' calculations of the quantity of JPATS aircraft needed to meet training requirements, (2) the impact of the Department of Defense's (DOD) procurement schedule on the aircraft's unit price, and (3) service efforts to design the JPATS cockpit to accommodate female pilots.

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## Background

The Air Force and the Navy plan to use the JPATS aircraft to train entry level Air Force and Navy student pilots in primary flying to a level of proficiency from which they can transition into advanced pilot training. The JPATS aircraft is designed to replace the Air Force's T-37B and the Navy's T-34C primary trainer aircraft and other training devices and courseware. It is expected to have a life expectancy of 24 years and provide better performance and improved safety, reliability, and maintainability than existing primary trainers. For example, the JPATS aircraft is expected to overcome certain safety issues with existing trainers by adding an improved ejection seat and a pressurized cockpit. The JPATS aircraft is expected to be more reliable than existing trainers, experiencing fewer in-flight engine shutdowns and other equipment failures. It is also expected to be easier to maintain because it is to use more standard tools, and common fasteners.

To calculate the number of JPATS aircraft required, the Air Force and the Navy in 1993, used a formula that considered such factors as the aircraft utilization rate, annual flying hours, mission capable rate, attrition rate, sortie length, working days, and turnaround time. The Air Force calculated a need for 372 JPATS aircraft, and the Navy calculated a need for 339, for a total combined requirement of 711 JPATS aircraft. In December 1996, the two services reviewed these requirements. At that time, the Navy approved an increase of 29 aircraft, increasing its total to 368 aircraft. This increased total requirements from 711 to 740 JPATS aircraft. The Air Force's Air Education and Training Command—responsible for pilot

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training—determined that the Air Force would need 441 aircraft instead of 372 aircraft. However, the Air Force did not approve this increase.

The JPATS aircraft shown in figure 1, the T-6A Texan II, is to be a derivative of the Pilatus PC-9 commercial aircraft. Raytheon Aircraft Company, the contractor, plans to produce the aircraft in Wichita, Kansas, under a licensing agreement with Pilatus, the Swiss manufacturer of the PC-9. The JPATS aircraft will undergo limited modification to incorporate several improvements and features that are not found in the commercial version of the aircraft, but are required by the Air Force and the Navy.

Modifications involve (1) improved ejection seats, (2) improved birdstrike protection, (3) a pressurized cockpit, (4) an elevated rear (instructor) seat, and (5) flexibility to accommodate a wider range of male and female pilot candidates. These modifications are currently being tested during the qualification test and evaluation phase, which is scheduled to be completed in November 1998. Initial operational capability is planned for fiscal year 2001 for the Air Force and fiscal year 2003 for the Navy.

**Figure 1: JPATS Aircraft, T-6A Texan II**



Source: JPATS Program Office.

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The Air Force and the Navy competitively selected an existing commercial aircraft design to satisfy their primary trainer requirements instead of developing a new trainer aircraft. This competitive acquisition strategy, according to Air Force officials, resulted in original program estimates of about \$7 billion being reduced to about \$4 billion upon contract award.

The Air Force, as executive agent for the program, awarded a contract to Raytheon in February 1996 to develop and produce between 102 and 170 JPATS aircraft with the target quantity of 140, along with simulators and associated ground based training system devices, a training management system, and instructional courseware. The contract included seven production options. Through fiscal year 1997, the Air Force has exercised the first four options, acquiring 1 aircraft for engineering and manufacturing development and 23 production aircraft. A separate contract was awarded to Raytheon for logistics support, with options for future years' activities. Production is scheduled to continue through 2014.

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## Results in Brief

The Air Force and the Navy used inconsistent data to calculate the number of JPATS aircraft required for primary pilot training. For example, in its 1996 calculations, the two services applied mission capable rates<sup>1</sup> that differed substantially from each other and were lower than the rate included in the contract to procure the aircraft. The Air Force used an attrition rate<sup>2</sup> that was twice as high as the historical attrition rate for its existing primary trainer and the Navy used an attrition rate that differs from the rate that DOD now cites as accurate. Until inconsistencies in the mission capable rates and attrition rates are resolved, it is unclear how many JPATS aircraft should be procured.

DOD's procurement plan for acquiring JPATS aircraft does not take full advantage of the most favorable prices available in the contract. For example, the plan schedules 18 aircraft to be procured during fiscal year 1998 and 12 aircraft during fiscal year 1999, a total of 30 aircraft. However, we found that these 30 aircraft could be procured more economically if 16, rather than 18, aircraft are procured in fiscal year 1998 and 14, rather than 12, aircraft are procured in fiscal year 1999. This approach would save \$1.36 million over the 2 fiscal years and permit more operational testing and evaluation to be completed. Furthermore, the procurement plan does not schedule a sufficient number of JPATS aircraft for procurement in fiscal

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<sup>1</sup>Mission capable rates are a measure of aircraft readiness to perform training missions.

<sup>2</sup>Attrition rates are a measure of aircraft lost or damaged beyond repair.

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year 2000 to achieve lower prices that are available under the terms of the contract.

Because concerns had been raised about the ability of JPATS aircraft to accommodate female pilots, Congress directed DOD to study and determine the appropriate percentage of the female pilot population that the aircraft should physically accommodate. Based on its studies, DOD established the requirement that the JPATS aircraft be able to accommodate 80 percent of the eligible female pilot population. Pilot size<sup>3</sup> determines the percentage of pilots that can be accommodated in the JPATS cockpit. Planned cockpit dimensions are expected to accommodate about 97 percent of the eligible female pilot population. To permit safe ejection from the aircraft, the ejection seat minimum pilot weight is 116 pounds, which is expected to accommodate 80 percent of the eligible female pilot population.

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## Calculation of JPATS Requirements Was Based on Inconsistent Data

In 1996, the Air Force and the Navy calculated the number of JPATS aircraft required using several factors, including projections of JPATS mission capable rates and projected attrition rates based on historical experience. However, the data they used in their calculations contained various inconsistencies. For example, the projections of JPATS aircraft mission capable rates of 91 percent and 80 percent used by the Air Force and the Navy, respectively, to calculate the requirements differed substantially from each other and from the 94-percent rate included in the contract for procurement of the aircraft. The result of using lower mission capable rates to calculate aircraft quantities is that more aircraft would be needed to achieve annual flying hour requirements for training than if higher rates were used. Furthermore, the Air Force's projected attrition rates were not consistent with historical attrition experience with its existing primary trainer, and the Navy used a rate that differs from the rate that DOD now says is accurate. Until these inconsistencies are resolved, it is unclear how many JPATS aircraft should be procured.

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## Mission Capable Rate Used in Calculations Differed Substantially

Although the Air Force and the Navy are procuring the same JPATS aircraft to train entry level pilots and the aircraft will be operated in a joint training program, they used different mission capable rates to calculate aircraft requirements. Specifically, the Air Force used a 91-percent mission capable rate and the Navy used an 80-percent rate. Neither of these rates is consistent with the JPATS contract that requires Raytheon to build an

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<sup>3</sup>The characteristics of the pilot size include sitting height, thumb tip reach, buttock-knee length, knee height sitting, eye height sitting, shoulder height sitting, shoulder breadth range, chest depth range, and thigh circumference range.

aircraft that meets or exceeds a 94-percent mission capable rate. Therefore, we recalculated the Air Force and the Navy total JPATS aircraft requirements using the same formula as the Air Force and the Navy, and substituting the 94-percent contract mission capable rate in place of the rates used by the Air Force and the Navy. Table 1 shows how higher mission capable rates could decrease JPATS aircraft quantity requirements by as many as 60 aircraft—10 for the Air Force and 50 for the Navy.

**Table 1: Comparison of Mission Capable Rates Used to Calculate Requirements With Rates Contractually Required for JPATS**

Mission capable rates	Total JPATS aircraft requirements	Difference
JPATS contract	94%	362
Air Force used to calculate requirements	91%	372
JPATS contract	94%	318
Navy used to calculate requirements	80%	368

## Attrition Rates Were Not Consistent With Historical Rates and Conflicted With DOD Data

The attrition rate used by the Air Force to calculate the number of JPATS aircraft needed was more than twice the attrition rate of its current primary trainer that was placed in service in the late 1950s. The Air Force estimated that 1.5 JPATS aircraft would be lost or damaged beyond repair for every 100,000 flying hours. However, the historic attrition rate for the current primary trainer is 0.7 per 100,000 flying hours. Although DOD advised us that single-engine trainers such as JPATS are expected to have higher attrition rates than two-engine trainers such as the T-37B, we note that important JPATS features are increases in safety and reliability, including fewer in-flight engine shutdowns and other equipment failures. In addition, use of an advanced ground based training system, being acquired as part of the JPATS program, is expected to result in greater pilot familiarity with the aircraft's operation prior to actual flights.

Data provided by the Navy and DOD regarding attrition rates are conflicting. For example, the Navy's calculations in 1996 used an attrition rate of 1.5 aircraft per 100,000 flight hours to calculate the required quantity of JPATS aircraft. To derive this rate, the Navy factored in the attrition experience of the existing T-34C trainer, using a lifetime attrition rate of 0.4 per 100,000 flight hours. However, in commenting on a draft of this report, DOD stated that the lifetime attrition rate for the T-34C is 2.1 aircraft per 100,000 flying hours and the Navy provided data that it believed supported this rate. However, our analysis showed that the data

supported a rate of 3.6 aircraft per 100,000 flying hours, which differs from both the Navy and DOD figure.

## DOD Is Not Taking Advantage of the Most Favorable Prices

The JPATS aircraft procurement plan does not take advantage of the most favorable prices provided by the contract. The contract includes annual options with predetermined prices for aircraft orders of variable quantities. Procurement of fewer than the target quantity can result in a unit price increase from 1 to 52 percent. Procurement above the target quantity, or at the maximum quantity, however, provides very little additional price reduction.

The contract contains unit price charts for the variation in quantities specified in lots II through VIII. The charts contain pricing factors for various production lot quantity sizes that are used in calculating unit prices based on previous aircraft purchases. The charts are designed so that the unit price increases if the number of aircraft procured are fewer than target quantities and decreases if quantities procured are more than target quantities.

As shown in table 2, lots II through IV have been exercised at the maximum quantities of 2 (plus 1 developmental aircraft), 6, and 15. According to the procurement plan, 18 aircraft are to be procured during fiscal year 1998 and 12 aircraft during fiscal year 1999, resulting in a total of 30 aircraft. All of these aircraft are being procured by the Air Force. In fiscal year 2000, the Navy is scheduled to begin procuring JPATS aircraft.

**Table 2: Variation in Unit Prices for Selected Procurement Quantities of JPATS Aircraft**

Fiscal year and procurement lot number	Minimum quantity	Target quantity	Maximum quantity	Procurement plan	Planned unit price
1995 (lot II) development aircraft	1	1	1	1 <sup>a</sup>	\$8,873,398 <sup>a</sup>
1995 (lot II)	1	2	2	2 <sup>a</sup>	\$8,004,807 <sup>a</sup>
1996 (lot III)	1	3	6	6 <sup>a</sup>	\$5,019,140 <sup>a</sup>
1997 (lot IV)	9	12	15	15 <sup>a</sup>	\$3,148,953 <sup>a</sup>
1998 (lot V)	12	18	22	18	\$2,748,590
1999 (lot VI)	12	18	22	12	\$2,904,649
2000 (lot VII)	22	32	40	26	\$2,627,519
2001 (lot VIII)	44	54	62	58	\$2,510,351

<sup>a</sup> Actual numbers of aircraft procured.

Our analysis shows that DOD can make better use of the price advantages that are included in the JPATS contract. For example, as shown in table 3, 30 aircraft can be procured more economically if 16, rather than 18, aircraft are procured in fiscal year 1998 and 14, rather than 12, aircraft are procured in fiscal year 1999. If as few as 16 aircraft were procured in fiscal year 1998, they could be acquired at the same unit price as currently planned because the unit price would not increase until fewer than 16 JPATS aircraft were procured in fiscal year 1998. Deferring 2 aircraft from fiscal year 1998 to fiscal year 1999 would increase the quantity in fiscal year 1999 from 12 to 14, resulting in a reduction of the unit price for fiscal year 1999, from \$2,905 million to \$2,785 million. This deferral would not only save \$1.360 million over the 2 years but also reduce the risk of buying aircraft before the completion of operational testing by delaying the purchase of two aircraft and permitting more testing to be completed.

**Table 3: Fiscal Year 1998 and 1999  
JPATS Unit Prices at Various  
Quantities**

	Fiscal year 1998	Fiscal year 1999	Total
Planned quantity	18	12	<b>30</b>
Unit cost	\$2,748,590	\$2,904,649	
Total cost	\$49,474,620	\$34,855,788	<b>\$84,330,408</b>
Our alternative	16	14	<b>30</b>
Unit cost	\$2,748,590	\$2,785,200	
<b>Total cost</b>	<b>\$43,977,440</b>	<b>\$38,992,800</b>	<b>\$82,970,240</b>
Savings	\$5,497,180	(\$4,137,012)	<b>\$1,360,168</b>

DOD could also save money if it altered its plans to procure 26 aircraft in fiscal year 2000, which is a quantity lower than the target of 32 aircraft. The unit price could be reduced by \$104,212, or 4 percent, if DOD procured the target quantity.

In addition, once the JPATS aircraft successfully completes operational test and evaluation, the aircraft could be procured at the more economical, or target, rates. Our analysis demonstrates that maintaining yearly production rates at least within the target range is more economical than production rates in the minimum range. As we previously reported, economical procurement of tested systems has often been hindered because DOD did not provide them with high enough priority.<sup>4</sup>

<sup>4</sup>Weapons Acquisition: Better Use of Limited DOD Acquisition Funding Would Reduce Costs (GAO/NSIAD-97-23, Feb. 13, 1997).

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## JPATS Aircraft Is Expected to Meet Female Cockpit Accommodation Requirement

The JPATS cockpit is expected to meet DOD's requirement that it accommodate at least 80 percent of the eligible female pilot population. Pilot size, as defined by the JPATS anthropometric characteristics, determines the percentage of pilots that can be accommodated in the JPATS cockpit. JPATS program officials estimate that the planned cockpit dimensions will accommodate approximately 97 percent of the eligible female population anthropometrically. The minimum design weight of the JPATS ejection seat (116 pounds) will accommodate 80 percent of the eligible female population.

Because concerns have been raised about the ability of JPATS aircraft to accommodate female pilots, Congress directed DOD to conduct studies to determine the appropriate percentage of male and female pilots that could be accommodated in the cockpit. A DOD triservice working group studied the issue and concluded that a 32.8-inch minimum sitting height, instead of 34 inches, is one of several variables that would allow for accommodation of at least 80 percent of the eligible female population. The DOD working group determined that this change in sitting height would not require major development or significantly increase program risk. Thus, the Office of the Secretary of Defense established 32.8 inches as the new JPATS minimum sitting height requirement. In addition, the minimum weight requirement for the JPATS ejection seat was lowered from 135 pounds to 116 pounds to accommodate 80 percent of the eligible female population. Another study is being conducted to investigate the potential, at minimum additional cost, for an ejection seat with a lighter minimum weight limit that might accommodate more than 80 percent of the female pilot trainee population. Phase one of that study is scheduled to be completed in the fall of 1997.

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## Conclusions and Recommendations

DOD is proceeding with plans to procure a fleet of JPATS aircraft that may exceed the quantity needed to meet training requirements. Until inconsistencies in the data used to calculate JPATS requirements are resolved, it is unclear how many aircraft should be procured. Furthermore, DOD's schedule for procuring the aircraft does not take advantage of the most economical approach that would allow it to save money and permit more time for operational testing. We, therefore, recommend that the Secretary of Defense

- determine the appropriate attrition rates and mission capable rates to calculate JPATS requirements, taking into account the planned

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improvements in JPATS safety, reliability, and maintainability, and recalculate the requirements as appropriate and

- direct the Air Force to revise the JPATS procurement plan to take better advantage of price advantages in the contract, and upon successful completion of operational test and evaluation, acquire JPATS aircraft at the most economical target quantity unit prices provided by the contract.

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## Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD did not agree with our conclusion that DOD overstated JPATS requirements or with our recommendation that the Secretary of Defense direct the Air Force and the Navy to recalculate aircraft requirements. DOD partially concurred with our recommendation to buy JPATS aircraft at the most economical target unit prices provided in the contract.

DOD believed that the Air Force and the Navy used appropriate attrition rates and mission capable rates to calculate JPATS requirements and that these rates accounted for improvements in technology and mechanical reliability. It noted that we had incorrectly identified the T-34C aircraft attrition rate as 0.4 aircraft per 100,000 flying hours rather than 2.1 aircraft per 100,000 flying hours. The Navy provided data that it believed supported DOD's position, but our analysis showed that this data supported an attrition rate that differed from both the Navy and DOD rate. Furthermore, DOD stated that the 94-percent mission capable rate cited in the JPATS contract is achievable only under optimal conditions and that the lower mission capable rates used by the Air Force and the Navy are based on the maximum possible aircraft use at the training sites. Although DOD stated that the Navy used a mission capable rate of 87 percent, our analysis showed that the Navy used a rate of 80 percent. Because of the inconsistencies and conflicts in the attrition and mission capable rate data between DOD and the services, we revised our conclusion to state that, until these discrepancies are resolved, it is unclear how many aircraft should be procured and revised our recommendation to call for the Secretary of Defense to determine the appropriate rates and recalculate JPATS requirements as appropriate.

DOD agreed that procuring aircraft at the most economical price is desirable and stated that it will endeavor to follow this approach in future JPATS procurement. It, however, noted that competing budget requirements significantly affect procurement rates of all DOD systems and that limited resources generally make procurement at the most economical rates unachievable. DOD's written comments are reprinted in appendix I.

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## Scope and Methodology

To review service calculations of JPATS requirements, DOD's procurement schedule for the aircraft, and efforts to design the JPATS cockpit to accommodate female pilots, we interviewed knowledgeable officials and reviewed relevant documentation at the Office of the Under Secretary of Defense (Acquisition and Technology) and the Office of the Secretary of the Air Force, Washington D.C.; the Training Systems Program Office, Wright-Patterson Air Force Base, Ohio; the Air Force Air Education and Training Command, Randolph Air Force Base, Texas; the Navy Chief of Naval Air Training Office, Corpus Christi, Texas; and the Raytheon Aircraft Company, Wichita, Kansas. We examined Air Force and Navy justifications for using specific attrition rates, mission capable rates, and flying hour numbers in determining aircraft quantities. We also analyzed the variation in quantity unit price charts in the procurement contract to determine the most economical way to procure JPATS aircraft. In addition, we reviewed congressional language on cockpit accommodation requirements and current program estimates of compliance with that requirement.

This review was conducted from September 1996 to July 1997 in accordance with generally accepted government auditing standards.

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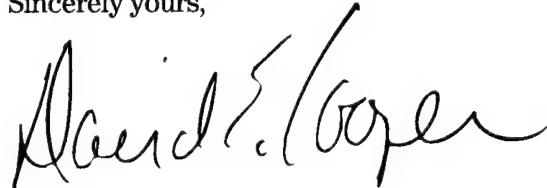
As the head of a federal agency, you are required under 31 U.S.C. 720 to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Reform and Oversight no later than 60 days after the date of this report. A written statement must also be submitted to the Senate and House Committees on Appropriations with an agency's first request for appropriations made more than 60 days after the date of this report.

We are sending copies of this report to the Secretaries of the Navy and the Air Force and to interested congressional committees. We will also make copies available to others upon request.

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Please contact me at (202) 521-4587 if you or your staff have any questions concerning this report. The major contributors to this report were Robert D. Murphy, Myra A. Watts, and Don M. Springman.

Sincerely yours,

A handwritten signature in black ink, appearing to read "David E. Cooper".

David E. Cooper  
Associate Director, Defense Acquisitions Issues

# Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

**OFFICE OF THE UNDER SECRETARY OF DEFENSE**

3000 DEFENSE PENTAGON  
WASHINGTON DC 20301-3000

17 JUL 1997

Mr. David E. Cooper  
Associate Director, Defense Acquisitions Issues  
National Security and International Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Cooper:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "Fewer Training Aircraft Than Planned Should Be Acquired," dated June 13, 1997, (GAO Code 707207). OSD Case 1386.

The Department nonconcurs with the recommendation to recalculate aircraft requirements and partially concurs with the recommendation to buy Joint Primary Aircraft Training System (JPATS) at the most economical target prices proposed by the contractor.

GAO recommends that the Secretary of Defense direct the Air Force and Navy to recalculate JPATS aircraft needs based on historical attrition rates and contractual mission capable rates. There is no need for the Department to recalculate JPATS requirements as GAO's assertion that the Department has overstated the number of JPATS aircraft required is incorrect. The Air Force and Navy used historical data for single-engine trainer aircraft, accounting for improvement in technology and mechanical reliability, to derive the 1.5 attrition rate and determine total aircraft requirements. The GAO incorrectly identifies the Navy T-34C attrition rate as 0.4 aircraft per 100,000 flying hours, while the actual lifetime attrition rate is 2.1. GAO also states that JPATS inventory requirements would be reduced if calculated on Raytheon's proposed Mission Capable (MC) rate of 94% rather than the as-contracted-for rates of 91% and 87% for Air Force and Navy, respectively. The 94% MC rate is achievable only under optimal conditions. It does not reflect the MC requirements which are based on maximum possible (non surge) aircraft utilization rates at the training sites.

GAO recommends that the Department revise (increase) production rates to acquire aircraft at the most economical target prices provided by the contractor. The Department partially concurs with this recommendation. The Department agrees that procuring at the most economic price is desirable, and we will endeavor to do just that in future JPATS procurements. However, the GAO should recognize that competing budget requirements within the Air Force and Navy significantly impact procurement rates of all DoD systems. Ideally, the Department would procure all its systems at the most economical rate; however, limited resources generally make this unachievable.

GAO

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**Appendix I**  
**Comments From the Department of Defense**

Detailed comments to your recommendations are attached. During our review, we noted several factual errors, and these were provided to you informally. The Department appreciates the opportunity to comment on the draft report.

Sincerely,



George R. Schneiter  
Director  
Strategic and Tactical Systems

Enclosure

**GAO DRAFT REPORT - DATED June 13, 1997**  
**GAO Code 707207, OSD Case 1386**

**“Fewer Training Aircraft Than Planned Should Be Acquired ”**

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**DEPARTMENT OF DEFENSE COMMENTS**

1. Required number of JPATS aircraft is overstated. The GAO reports claims that the Air Force and Navy have overstated the required number of T-6As due to inappropriate projections of aircraft attrition rates and mission capable (MC) rates.

a. Attrition Rates Too High. The GAO incorrectly identifies the Navy T-34C attrition rate as 0.4 aircraft per 100,000 flying hours. 0.4 aircraft per 100,000 flying hours is the average T-34C attrition rate for the last four years. The lifetime T-34C attrition rate is 2.1 aircraft per 100,000 flying hours. The report also compares the twin-engine T-37 attrition rate of 0.7 with the JPATS attrition rate suggesting the JPATS rate should be lower due to advances in technology and improved safety. However, single-engine trainer attrition rates are higher than twin-engine attrition rates. The Air Force and Navy used historical data for single-engine trainer aircraft, accounting for improvements in technology and mechanical reliability, to derive the 1.5 attrition rate and determine total aircraft requirements.

b. Mission Capable Rates Too Low. The GAO identified MC rates as being too low. They emphasized that Raytheon signed up to provide the Air Force an MC rate of 94%. The Air Force Education and Training Command's (AETC) objective, as specified in the Operational Requirements Document (ORD), is a 91% MC rate. The contracted MC rate is what the aircraft should be capable of sustaining, not what is operationally practical or affordable.

The Air Force recognizes that improvements in technology have increased the overall reliability of aircraft; however, to operate at a 94% MC rate with 10 fewer aircraft, as suggested by the GAO, requires a higher monthly utilization (UTE) rate and increases the number of sorties/day each aircraft supports. Due to the nature of the primary training environment, AETC determined a 55-hour UTE rate is the maximum their operations can support. The 91% MC is derived from that UTE rate. Although AETC can't take advantage of the potential higher MC rate on a daily basis, it does provide AETC with a surge capability when necessary and may eventually result in lower maintenance costs.

Similarly, for the Navy, JPATS and the T-34 will operate with identical scheduled utilization rates based on current Contractor Logistics Support (CLS); 60 hours per month. The Chief of Naval Aviation Training has stated that a limiting training factor is 720 hours per aircraft

See comment 2.

per year. Certainly, the 94% MC rate established by the contractor is mandatory for surge operations, but it is not the sole factor in determining the number of aircraft required for student training.

See comment 2.

In addition, Raytheon has stated that 94% MC is achievable only under optimal conditions. Optimal conditions would include: a 3-shift-per-day operation with premium transportation, and expedited repair and increased spares and support equipment pools -- none of which is included in the current CLS contract. The specified MC levels strike a balance between procurement and CLS costs.

See comment 5.

Air Force Initial Operating Capability (IOC) is scheduled for August 2001. The Air Force is scheduled to procure aircraft through 2008 and the Navy through 2015. If actual data indicate a need to revise the attrition or mission capable rates, there is sufficient time available. It is premature to revise these figures at this time.

See comment 3.

2. Air Force Not Taking Advantage Of The Most Favorable Prices. The GAO's discussion on the proper mix of aircraft procured between FY98 and FY99 is based on two assumptions: (1) a maximum of 30 aircraft will be purchased during the two-year period; and (2) resources in each year will support the procurement rate their analysis indicates to be optimum. Neither assumption is valid. First, the total quantity could change (up or down) based on budget increases or cuts. For example, the House National Security Committee and the Senate Armed Services Committee have recently moved to increase the requested FY98 quantity to the contractual maximum of 22 in the ongoing Congressional mark-up process. Second, barring specific Congressional direction to use appropriated funds to buy a specific quantity of JPATS aircraft, the decision on what quantity to buy is not made in isolation. SECDEF is responsible for executing the JPATS program in the context of managing Air Force resources. In that context, SECDEF will balance the unit price advantages of buying higher annual quantities with the advantages associated with other uses of scarce budget dollars.

#### **Recommendations**

**Recommendation 1:** The GAO recommended that the Secretary of Defense direct the Air Force and Navy to recalculate JPATS aircraft needs based on historical attrition rates and contractual mission capable rates.

See comments 1 and 4.

**DoD Response:** Nonconcur. The GAO incorrectly identifies the Navy T-34C attrition rate as 0.4 aircraft per 100,000 flying hours. The actual T-34C attrition rate is 2.1 per 100,000 flying hours. The Air Force and Navy used historical data for single-engine trainer aircraft, accounting for improvements in technology and mechanical reliability, to derive the 1.5 attrition rate and determine total aircraft requirements.

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**Appendix I**  
**Comments From the Department of Defense**

See comments 2 and 5.

The contracted MC rate is what the aircraft should be capable of sustaining, not what is operationally practical or affordable. It would be inappropriate to adjust the inventory requirements as the Services are unable to take advantage of the potential higher MC rate on a daily basis at this time. A reduction in aircraft quantities would necessitate a higher monthly UTE rate than the training commands can support.

See comment 5.

JPATS procurement is planned through 2015. If the data indicate a need to revise the attrition or mission capable rates, the Department will do so at the appropriate time. It is premature to revise these figures at this time.

**Recommendation 2:** The GAO recommended that the Secretary of Defense direct the Air Force to revise the JPATS procurement plan for fiscal years 1998 and 1999 to take better advantage of the variation in quantity provision in the contract, and upon successful completion of operational test and evaluation, acquire JPATS aircraft at the most economical target quantity unit prices provided by the contract.

**DoD Response:** Partially Concur. The Department agrees that procuring at the most economic price is desirable, and we will endeavor to do just that in future JPATS procurements. However, the GAO should recognize that competing budget requirements significantly impact procurement rates of all DoD systems. Ideally, the Department would procure all its systems at the most economical rate; however, limited resources generally make this unachievable.

The GAO's discussion on the proper mix of aircraft procured between FY98 and FY99 is based on two assumptions: (1) a maximum of 30 aircraft will be purchased during the two-year period; and (2) resources in each year will support the procurement rate their analysis indicates to be optimum. Neither assumption is valid. First, the total quantity could change (up or down) based on budget increases or cuts. For example, the House National Security Committee and the Senate Armed Services Committee have recently moved to increase the requested FY98 quantity to the contractual maximum of 22 in the ongoing Congressional mark-up process. Second, barring specific Congressional direction to use appropriated funds to buy a specific quantity of JPATS aircraft, the decision on what quantity to buy is not made in isolation. SECDEF is responsible for executing the JPATS program in the context of managing Air Force resources. In that context, SECDEF will balance the unit price advantages of buying higher annual quantities with the advantages associated with other uses of scarce budget dollars.

DoD response

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The following are GAO's comments on the Department of Defense's (DOD) letter dated July 17, 1997.

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## GAO Comments

1. The Navy, in deriving the projected attrition rate of 1.5 aircraft losses per 100,000 flying hours for Joint Primary Aircraft Training System (JPATS) aircraft, used a 0.4-lifetime attrition rate for the T-34C in determining total aircraft requirements. DOD, in its response to our draft of this report, stated that the actual lifetime attrition rate for the T-34C is 2.1; however, the data provided to support that rate indicated an attrition rate of 3.6 aircraft per 100,000 flying hours. Because the attrition rate figures provided to us for the Navy's T-34 differ substantially, the Air Force's estimated attrition for JPATS aircraft is twice the rate experienced on the T-37, and the Air Force's Air Education and Training Command has revised its calculations of requirements, we believe reassessment of requirements for JPATS aircraft is needed.
2. The JPATS production contract specifies the aircraft shall meet or exceed a 94-percent mission capable rate for the total hours the aircraft is in the inventory and does not specify the severity of conditions. Although the Navy now maintains that its requirement was for a primary trainer aircraft with an 87-percent mission capable rate, the Navy used, and continues to use, an 80-percent mission capable rate in calculating JPATS aircraft quantity requirements. The latest JPATS Operational Requirements Document, issued December 1996, shows an 80-percent mission capable rate for the Navy, not 87 percent as indicated in DOD's response to our draft report.
3. We recognize that limited resources and competing budget requirements affect production rates; however, the point we made was that DOD's procurement plan (the future years defense plan) for acquisition of JPATS aircraft did not make the best use of the limited resources that had already been assigned to the JPATS program. Our report, on page 6, illustrates how, with fewer resources, the Air Force could have acquired the same number of aircraft over a 2-year period. The illustration is valid, in that it shows that the DOD procurement plan was not the most effective and that it should be reassessed. Indeed, the procurement quantities in the plan for fiscal years 1999 and 2000 continue to include insufficient quantities for DOD to take advantage of the most favorable prices in the contract, and without a reassessment and a change to the plan, Congress may need to ensure that resources are used most effectively.

4. DOD did not provide us information to show how historical data for single-engine trainer aircraft were used to predict the JPATS rate of 1.5 losses per 100,000 flight hours. We believe that a predicted attrition rate for JPATS aircraft that is twice that of 40-year old T-37 trainers does not account for improvements that are to be incorporated in JPATS aircraft.

5. We do not believe it is premature at this time to reassess JPATS requirements. We believe reassessment is needed now because

- the Navy has provided several different attrition rates, all of which are intended to represent T-34 historical experience;
- the proposed JPATS attrition rate is twice the historical rate of the Air Force T-37; and
- the Air Force and the Navy continue to project different mission capable rates for JPATS aircraft that are lower than the rate the aircraft is required to demonstrate under the contract.

We agree that, as experience is gained with the JPATS aircraft, the quantities should also be reassessed periodically.